

Comparing Perceval Aortic Valve Sizing: Diameter Derived From Area Versus Perimeter

Shubham Lahan, Fatima Qamar, Adham Elmously,
Moath Said Alfawara, Mohammed Chamsi-Pasha, Mahesh Ramchandani

OBJECTIVE

- Use of Transcatheter aortic valve implantation - computed tomography (TAVI-CT) protocol is currently being investigated as an adjunct for selecting appropriate size for the Perceval Aortic Valve (AV).
- We aimed to evaluate the correlation between the diameter derived from perimeter (Dp) and diameter derived from area (Da) with the actual size of the implanted Perceval AV.

METHODS

- Using a natural language processing algorithm, data were extracted from tertiary care hospital’s in-patient database on patients who underwent Perceval AV implantation for severe aortic stenosis via midline sternotomy or minimally invasive approach between June 2016 and Jan 2023.
- The area and perimeter of the aortic annulus were calculated using CT measurements in the 30% systole phase.

TABLE

Characteristic	N = 112
Age (yrs)	67 (60, 74)
Men	61 (55%)
Underlying comorbidities	
Myocardial infarction	44 (40%)
Congestive heart failure	71 (64%)
Peripheral vascular disease	70 (63%)
Cerebrovascular disease	94 (85%)
COPD	41 (37%)
Diabetes	49 (44%)
Diabetes with complications	29 (26%)
Renal Disease	53 (48%)
Isolated AVR	85 (76%)
Redo AVR	14 (12%)
MICS	58 (52%)
Valve size	
S (19–21 mm)	27 (24%)
M (21–23 mm)	37 (33%)
L (23 –25 mm)	33 (29%)
XL (25 – 27 mm)	15 (13%)
Preoperative aortic annular area (mm ²)	80 (68, 90)
Post-operative aortic annular area (mm ²)	160 (130, 190)
Preoperative mean aortic gradient (mmHg)	45.67 ± 13.5
Post-operative mean aortic gradient (mmHg)	12.24 ± 7.0
Intra-op Paravalvular leak	2 (1.9%)
Length of stay (Days)	7.0 (6.0, 11.0)
Death	3 (2.6%)

Data represented as N (%), Mean ± SD, Median (IQR)

RESULTS

- We report data on 112 patients with a median age of 67 (60–74) years, of which 55% were men.
- The majority of the patients were Caucasians (85%). Of the total, 76% of the patients underwent isolated AV replacement and 12% underwent redo surgeries.
- Over half of the patients had minimally invasive surgery.
- Mean pre-operative gradient across the AV was 45.67 ± 13.5, which decreased to 12.24 ± 7.0 mmHg post-operatively (Table).
- We found that the correlation coefficient between Da and diameter of the actually implanted AV was 0.81 vs 0.76, the correlation coefficient between Dp and actual valve implanted.

CONCLUSIONS

- Our findings suggest that Da more accurately correlated with the diameter of the actually implanted AV compared to Dp.